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TABLE V.—*Excess of annual death rate per 100,000, from influenza and pneumonia (all forms), by weeks, Sept. 8 to Nov. 30, 1918, over that in corresponding week of median year (1910–1916) in certain large cities.*[1]

City.	Sept. 14.	Sept. 21.	Sept. 28.	Oct. 5.	Oct. 12.	Oct. 19.	Oct. 26.	Nov. 2.	Nov. 9.	Nov. 16.	Nov. 23.	Nov. 30.
Albany, N. Y	37	......	31	29	2,018	5,025	8,535	7,087	2,300	800	41	488
Atlanta, Ga	110	......	15	82	666	1,972	2,471	849	633	499	402	643
Baltimore, Md	−37	−50	43	794	4,253	10,419	8,194	2,915	953	189	53	65
Birmingham, Ala	−23	−26	−33	322	1,493	2,770	3,369	2,095	1,061	1,056	990	1,694
Boston, Mass	188	1,634	5,015	7,925	6,680	3,765	1,350	753	343	143	172	156
Buffalo, N. Y	17	56	96	444	1,892	5,752	7,880	4,894	1,723	743	217	216
Cambridge, Mass	253	109	4,829	6,461	5,285	2,845	867	759	189	262	248	140
Chicago, Ill	−53	−50	79	728	1,988	4,105	4,620	2,801	1,316	600	305	223
Cincinnati, Ohio	−1	−21	−4	137	749	2,291	3,386	2,957	1,882	1,046	1,137	997
Cleveland, Ohio	−26	−9	−2	44	177	928	2,818	4,282	3,256	2,132	1,403	1,113
Columbus, Ohio	−28	40	83	170	579	1,613	2,623	2,084	1,057	721	860	1,315
Dayton, Ohio	33	−9	23	132	1,155	5,248	5,352	4,463	2,535	688	45	359
Fall River, Mass	......	264	715	3,863	8,095	7,730	3,863	1,533	869	447	267	128
Grand Rapids, Mich	......	......	......	......	......	......	......	......	......	1,059	788	628
Indianapolis, Ind	−6	44	111	356	745	2,210	1,968	1,402	926	735	967	1,653
Jersey City, N. J	−65	−2	242	973	3,666	......	6,823	......	......	......	......	......
Kansas City, Mo	28	......	103	47	1,521	2,713	3,117	3,173	2,177	1,198	921	1,461
Los Angeles, Calif	26	−14	−42	70	576	1,144	2,625	3,435	2,759	2,664	1,688	1,405
Louisville, Ky	20	143	26	228	1,889	3,764	3,770	1,348	1,098	678	584	1,159
Lowell, Mass	−15	311	1,451	4,358	6,644	5,441	3,902	1,311	252	242	375	−73
Memphis, Tenn	......	......	......	......	2,624	6,042	5,479	2,254	......	392	402	−20
Milwaukee, Wis	......	−4	91	108	711	1,215	1,915	1,328	971	675	427	873
Minneapolis, Minn	−19	......	97	120	592	1,280	1,963	1,541	1,191	1,151	575	490
Nashville, Tenn	21	......	45	124	5,538	8,327	5,420	2,206	2,135	446	464	747
Newark, N. J	......	9	27	565	2,205	4,709	5,123	4,444	2,014	1,200	687	501
New Haven, Conn	......	−32	401	1,102	2,479	4,996	6,033	5,519	2,615	1,459	503	621
New Orleans, La	−23	......	−54	294	1,852	8,385	9,156	4,368	1,957	822	281	356
New York, N. Y	−20	11	93	629	2,010	4,107	5,091	4,259	2,122	885	473	223
Oakland, Calif	19	......	−32	−9	354	936	3,271	5,679	3,728	1,603	811	164
Omaha, Nebr	−53	......	−26	121	1,887	4,547	4,164	2,618	......	1,245	929	790
Philadelphia, Pa	−3	31	157	2,014	7,716	13,515	8,841	3,448	986	350	154	106
Pittsburgh, Pa	−18	14	146	430	805	3,197	4,816	5,269	6,726	4,369	3,070	2,293
Providence, R. I	3	115	348	1,868	3,587	4,948	4,210	2,558	1,162	575	502	290
Richmond, Va	66	31	57	1,246	4,149	6,275	4,025	2,166	760	586	243	577
Rochester, N. Y	−42	−49	61	32	612	1,902	4,077	3,989	1,914	886	646	585
St. Louis, Mo	15	17	57	82	478	1,135	1,436	1,581	1,378	1,358	1,089	1,374
St. Paul, Minn	21	......	12	−32	1,177	1,458	1,091	2,000	2,141	2,664	1,705	1,306
San Francisco, Calif	−28	53	55	50	92	1,300	5,899	7,927	4,397	2,041	857	466
Syracuse, N. Y	......	......	1,150	4,410	6,991	8,085	4,425	2,088	784	610	83	76
Toledo, Ohio	−20	......	30	−13	101	886	2,642	2,168	1,575	769	690	421
Washington, D. C	68	52	373	2,174	6,257	7,989	4,955	2,240	584	394	312	364
Worcester, Mass	141	438	2,955	5,891	6,813	4,702	2,465	1,662	......	272	744	462

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[1] The weekly rates for the median year in the period 1910–1916 have been approximated by plotting the rate for the median year for each month (thus affording a rough "normal" seasonal curve) for each city, and then by reading from the curve the indicated median rate at the midpoint for each week. The excess has been found by subtracting this median rate from the actual rate for each week in 1918. When the difference is "minus" it is so indicated.

BOTULISM.

PROTECTIVE MEASURES AND CAUTIONS FROM THE U. S. BUREAU OF CHEMISTRY, DEPARTMENT OF AGRICULTURE.

The Public Health Service, in common with other Federal, State, and municipal authorities charged with the enforcement of laws and regulations for the protection of the public health, has been deeply concerned because of the frequent reported fatalities in different sections of the country attributed to the consumption of food products infected with the organism known as *Bacillus botulinus.* These fatalities have quite recently been traced to the consumption of ripe olives, although some cases have also been traced to home-canned string beans, home-canned asparagus, and home-canned corn. In making inquiries as to the activities of various Government agencies in connection with outbreaks of botulinus poisoning the Public Health Service has learned that the Bureau of Chemistry of the Department of Agriculture, which is charged with the enforcement of the Federal food and drugs act, has been particularly active in the investigation of these cases. Investigations have been directed by that bureau, not only toward an application of the safeguards provided by the terms of the law for the removal of dangerous material from the market, but also to a scientific investigation of the causes and characteristics of botulinus decomposition.

The first case of well-authenticated botulism among the recent group of poisoning cases occurred at Alliance, Ohio. Immediately following the report of this case, the Bureau of Chemistry began an investigation supplementing that carried on by State and municipal authorities. A comparatively short time after this first outbreak, a second occurred at Detroit, Mich. Both instances were traced to a single brand of ripe olives packed in glass, and further investigations developed the fact that the olives in both cases were packed upon the same day and taken from the very same factory batch. As soon as the identity of the batch was established, the Bureau of Chemistry, through its California agents, secured a list of the various consignees to whom olives from this batch had been shipped. These shipments were then followed to the establishments of the various consignees and the remaining portions of them were embargoed, sampled, and examined for *Bacillus botulinus*. Every suspicious lot was seized under the authority of the Federal food and drugs act. It is reasonably certain that every jar of this particular batch has been removed from all possibility of human consumption.

Following the Alliance, Ohio, and Detroit, Mich., cases another series of fatalities, attributed this time to stuffed ripe olives, occurred at Kalispell, Mont. The olives in this case were traced to another manufacturer and the Bureau of Chemistry is now taking steps through its California representatives and its agents in all sections of the United States to trace down and remove from the market all lots of the batch involved in this case. Recently reported cases traceable to ripe olives occurred in New York City, and every jar of the lot responsible for those cases has already been traced down by the bureau's agents and New York City health officials.

Investigations so far carried on have shown that fatalities due to the consumption of olives have been limited to ripe olives packed in glass. No cases have been reported from the consumption of ripe olives packed in tin. Representatives of the Bureau of Chemistry have made careful investigations of the olive-packing plants in California, and it has been found that the process of sterilization employed in the case of olives packed in glass is usually inadequate.

The jars are usually heated for a period of approximately one-half hour at the temperature of boiling water, which is not sufficient to insure the destruction of the *Bacillus botulinus* if this organism is present in ripe olives. According to investigations made to date by the Bureau of Chemistry it would appear that the public may protect itself by refraining for the present from the consumption of ripe olives packed in glass. As a further measure of precaution, no food of any description showing even the slighest unnatural odor, unnatural color, swelling of the container, signs of gas, or any evidence of decomposition, whatever should be used for food purposes. In practically every case of botulism the food was shown to have had an offensive or abnormal odor. While all spoiled food may not contain *Bacillus botulinus*, any spoiled food, even though the spoilage be slight, may contain it, and, in view of the fatal effect of very small amounts of the toxin which this organism generates, the only safe rule is to examine carefully all food products before they are served and to discard those which are even slightly suspicious.

The Bureau of Chemistry has used every possible effort and has gone to the limit of its legal authority to remove all dangerous foods from the market by seizure under the food and drugs act. Since the law authorizes seizure only when the foods are actually found to be decomposed or to contain poisonous ingredients, since only an occasional package in millions is infected with *Bacillus botulinus*, and since it is physically possible to open and examine but a comparatively few of the millions of containers entering interstate commerce, it is beyond the power of any of the authorities to protect the public completely. For this reason, the necessity for scrupulous care on the part of persons opening and serving foods to discard anything which is spoiled is emphasized.

No one knows just how the *Bacillus botulinus* gets into any particular food. It has been found in articles put up in the home by the careful housewife and in goods packed in commercial establishments. It may be present in a few packages only of any lot. There is no method, the Bureau of Chemistry states, by which the packers or home canners can assure themselves by casual examination before canning that a product does not contain the *Bacillus botulinus*. If the food were in all cases properly sterilized and perfectly sealed, the development of the poison would be impossible, but no method of preserving food has yet been found which eliminates the occasional spoiled package. Failure to sterilize may not become apparent for weeks or even months after the canning of the article. If signs of spoilage have appeared when the container is opened, it is a clear warning that the product is no longer edible.

There is no greater probability of botulinus poisoning in olives than in many other food products either commercial or domestic.

Until this year it has been more commonly found in string beans, asparagus, and the like. It was originally found in sausage. It has been found in cheese; it is present sometimes in stock food, such as moldy hay and other kinds of spoiled forage, but it has never been found in the Bureau of Chemistry's investigations in any kind of food that was not spoiled.

The most recent reports received by the Public Health Service are from the State health officer of Tennessee, stating that during the first week in February six deaths had occurred in Memphis, due to eating canned ripe olives of the same brand as that held responsible for the deaths in Detroit.

A telegram has been sent by the Public Health Service to all State health officers advising them in detail as to all reports received by the service.

DIFFICULTIES IN COMPUTING CIVIL DEATH RATES FOR 1918, WITH ESPECIAL REFERENCE TO EPIDEMIC INFLUENZA.[1]

By Edgar Sydenstricker, Statistician, and Mary L. King, Statistical Clerk, United States Public Health Service.

Abnormal Conditions Affecting the Distribution of Population in 1918.

Various conditions are known to have existed in 1918 which caused an abnormal distribution of population in the various demographic groups commonly employed in vital statistics. Mention has been made already of them, such as (1) the withdrawal of over 4,000,000 males of certain ages from civil life for the armed forces in the War with Germany, a condition which affected some localities more than others and which varied in its influence upon the sex and age composition of the population at different times during the period beginning April, 1917; (2) the movement of population, particularly of persons of industrial ages, to localities and areas where war industries were concentrated; (3) changes in the occupational status of the population, which were particularly important from the points of view of sex and age, since the number of women and the number of men above the usual wage-earning age were increased in some occupations; (4) a well-defined movement of negroes of certain ages from southern into northern and eastern States.

It is obvious that, in expressing mortality rates and other ratios for the period in question, some account should be taken of these factors. Their effects are too important to be ignored or to be dismissed with the comforting guess that the more or less conflicting changes had "compensating" effects. Unfortunately, their maxi-

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[1] From the Statistical Office, United States Public Health Service. Acknowledgments are made to Dr. William H. Davis, chief statistician for vital statistics, Bureau of the Census, for the use of mortality data for Indiana and for computations of rates by certain methods to which specific reference is made in this paper.